

Claims

1. An isolated or purified 55kDa extracellular protein of *Photobacterium damsela* subsp. *piscicida* having apoptogenic properties, or an immunogenic derivative thereof.
2. An isolated amino acid sequence comprising SEQ ID NO:2, or an immunogenic derivative thereof.
3. An isolated nucleic acid sequence comprising SEQ ID NO:1, or a substantially homologous sequence, or a fragment thereof, or a sequence hybridizing thereto under stringent conditions.
4. An isolated nucleic acid sequence according to claim 3 encoding an immunogenic derivative of SEQ ID NO:2.
5. A vaccine comprising an amino acid sequence derivative according to claim 2, and a pharmaceutically acceptable carrier.
6. A vaccine according to claim 5 wherein said derivative is an immunogenic fragment of SEQ ID NO:2.
7. A vaccine according to claim 5 or claim 6 wherein said derivative is a recombinantly expressed protein.
8. Use of an amino acid sequence or derivative according to claim 2 as a medicament.
9. Use of an amino acid sequence derivative according to claim 2 in the manufacture of a medicament to prevent or treat pasteurellosis in fish.
10. Antibodies raised against the isolated amino acid sequence of claim 2.
11. A DNA expression vector comprising the nucleic acid sequence of claim 3 wherein said nucleic acid sequence is operably linked to a transcriptional regulatory sequence.

12. A host cell transformed with the DNA expression vector of claim 11.
13. A vaccine comprising the DNA expression vector of claim 11, and a pharmaceutically acceptable carrier.
14. A method of preventing or treating pasteurellosis in a fish vulnerable to the disease, comprising administering to said fish a vaccine according to claim 5 or claim 13.
15. A method of preparing a vaccine against pasteurellosis, comprising the steps:
 - (a) growing *Photobacterium damsela* subsp. *piscicida* cells in culture;
 - (b) separating supernatant from the cells;
 - (c) optionally, concentrating the supernatant; and
 - (d) inactivating the supernatant with an inactivating agent.
16. A method according to claim 15 wherein in step (a) the cells are grown until mid-exponential phase, at which point step (b) is carried out.
17. A method according to claim 15 or claim 16 wherein said inactivating agent is formaldehyde.
18. A vaccine composition comprising an inactivated cell culture supernatant or extracellular protein preparation rich in p55 from *Ph. damsela* subsp. *piscicida*.
19. A vaccine composition according to claim 18 wherein said inactivated cell culture supernatant or extracellular protein preparation is the sole immunogenic component of the vaccine composition.
20. A vaccine composition according to claim 18 or claim 19 wherein the cells have been cultured without iron supplementation and in the absence of iron chelating agents.
21. A vaccine composition according to claim 20 wherein said cells have been cultured in medium containing less than 15µm iron.

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22. A vaccine composition according to any of claims 18 to 21, wherein said cell culture supernatant is prepared from cell cultures grown to mid-exponential phase.
23. A vaccine composition according to claim 18, obtainable by the method of claim 15.
24. Use of an isolated amino acid sequence according to claim 2 or an isolated nucleic acid sequence according to claim 3, or antibodies according to claim 10 in the manufacture of a test for the diagnosis of infection with *Photobacterium damsela* subsp. *piscicida* or of pasteurellosis in fish.
25. A diagnostics test kit comprising an isolated amino acid sequence according to claim 2 or an isolated nucleic acid sequence according to claim 3, or antibodies according to claim 10, affixed to a matrix.